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UNITED STATES DEPARTMENT OF AGRICULTURE.

BULLETIN No. 729

Contribution from the Bureau of Markets, CHARLES J. BRAND, Chief

Washington, D. C.

July 24, 1918

SUITABLE STORAGE CONDITIONS
FOR CERTAIN PERISHABLE
FOOD PRODUCTS

Apples, Potatoes, Sweet Potatoes, Onions, Cabbage, Eggs,
Frozen Eggs, Poultry, Butter,
and Fish

CONTENTS

	Page
Introduction	1
General Considerations	2
Essentials of Successful Storage.....	3
	Page
Apples	3
Potatoes	4
Sweet Potatoes.....	5
Onions	5
Cabbage	6
Eggs in the Shell.....	6
Frozen Eggs	7
Dressed Poultry.....	8
Butter.....	9
Fish.....	9



1918

WASHINGTON

THIS bulletin has been prepared in explanation of a chart recently drawn up by the Department of Agriculture for the use of the Federal Reserve Board, in which information regarding storage conditions for certain perishable farm products is set forth.

The information contained in this bulletin and the accompanying chart has been contributed by L. C. Corbett, William Stuart, and H. C. Thompson of the Bureau of Plant Industry; M. E. Pennington of the Bureau of Chemistry, and I. C. Franklin, N. A. Hardin, C. W. Mann, H. J. Ramsey, and W. M. Scott of the Bureau of Markets.

Owners and managers of storage warehouses, members of the Federal Reserve Banks, and producers of the farm products discussed will find information of value in the data included in this publication.

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FROZEN EGGS, POULTRY, BUTTER, AND FISH.

INTRODUCTION.

FOR a number of years the Department of Agriculture has been accumulating information concerning the factors which influence the keeping of various perishable farm products in storage. Some of this information has been published in various bulletins of the department, but much of it has not been made available in convenient form for the use of those operating storage warehouses. Recently the Federal Reserve Board requested the Department of Agriculture to furnish it with information as to "proper storage conditions," "length of storage" and "percentage of shrinkage in storage" for each of several perishable commodities which might be considered sufficiently staple to receive the benefit of the preferential rate of rediscount in connection with loans made by member banks against warehouse receipts for such products "properly graded, packed and stored in weather-proof and responsible warehouses." This information has been prepared on apples, potatoes, sweet potatoes, onions, cabbage, eggs, frozen eggs, poultry, butter and fish and for convenience it has been tabulated in the form of a folding chart or table. (See envelope in back cover of this bulletin.)

The data contained in this chart represent the results of investigations and observations made by various workers in the Department of Agriculture. While the information given is not complete and may not, in all cases, represent ideal conditions of storage, it gives methods and conditions which thus far have been found to produce the most satisfactory results.

GENERAL CONSIDERATIONS.

The function of the storage warehouse is to preserve the product, so as to extend its season of distribution to the consumer. This is accomplished by providing certain conditions of temperature, moisture and ventilation which arrest the deteriorating processes and retard the development of decay-producing organisms. The warehouseman is responsible for the quick cooling of the product after it is placed in storage as well as for the maintenance of proper temperature and humidity conditions. Too much emphasis cannot be given to the matter of holding even temperatures in storage rooms. Fluctuations in the temperature shorten the storage life of fruits and vegetables, and cause deterioration of such products as fish and poultry. As a guide in maintaining uniform temperatures an accurate thermograph record should be kept. The thermograph, or recording thermometer, should be corrected when necessary with an accurate mercury thermometer.

The relative humidity of the air in storage rooms has an important relation to the keeping quality of the product. When the humidity or moisture content of the air is too low there is deterioration through the increased loss of moisture by the product, causing shrinkage or wilting; when it is too high moisture may be deposited on the product, making conditions favorable for the growth of molds and bacteria. Most of the common fruits and vegetables require a high humidity and low temperature in storage, although a drier atmosphere is desirable for certain products, as in the case of sweet potatoes and onions. In common storage houses, special methods for producing and maintaining a high relative humidity are necessary.

The period during which perishable products will keep in good condition usually depends as much on the treatment they receive before being placed in storage as on the conditions under which they are held in storage. In many cases the responsibility rests as much with the producer or handling organization as with the storage warehouseman. Varieties, stage of maturity and soundness are among the considerations which are discussed more fully elsewhere. Containers used in storing food products should be clean and strongly made. In storing they should be so arranged as to permit of free and unobstructed air circulation through and around all containers.

It is often difficult to determine the probable storage life or possible storage period of a perishable food product. The best methods for handling and the most suitable storage conditions vary with the different products. The storage life of the product is governed primarily by the extent to which carefully established methods of handling and storage have been followed. Frequent and thorough inspection

of the product in storage is essential to avoid losses from deterioration and decay resulting from improper methods of handling to which commercial stocks often are subjected.

Under the column headed "Storage period" in the table, it is not intended to fix absolute storage limits, or the time at which stored perishable food products must be placed on the market. It is intended rather to indicate the storage period which experience has shown to be generally safe for the various products, and after which, in some cases, decline in market value is likely to begin. The storage period refers to the length of time the product, when properly handled, may be safely held if placed in storage in its normal season.

ESSENTIALS OF SUCCESSFUL STORAGE.

A brief consideration of the fundamental factors governing the successful handling and storage of the food product involved will help to make clear the data presented in the table. The following discussion of the proper methods of handling and the warehouse conditions adapted to the successful storage of these products is intended merely to supplement and explain the information contained in the table.

APPLES.

There is a wide variation in the storage quality of the different varieties of apples and of the same variety grown in different regions. The results of commercial experience usually indicate the relative storage season of different varieties in a given region.¹

The inherent keeping qualities of apples in storage are definitely related to the cultural and orchard sanitation practices of the grower, who is responsible for the production of sound, properly matured fruit. To have good keeping qualities, apples should be fully grown and well colored. When properly matured and colored they are less likely to scald and are in better condition generally to be held in storage for the maximum period. Apples that from a storage standpoint are overripe, whether they have ripened on the trees or while awaiting delayed storage, have passed their prime condition and may be expected to deteriorate quickly in storage.

Apples should be handled in all the operations of picking, grading, packing and hauling with that degree of care necessary to prevent serious bruising, skin punctures or other mechanical injuries. To insure soundness and good keeping quality, apples must be properly grown, carefully handled in harvesting and packing and stored as quickly as possible after they are picked.

¹ Ramsey, H. J., and others. The handling and storage of apples in the Pacific Northwest, U. S. Department of Agriculture, Bulletin 587. 1917.

A uniform temperature of 31° to 32° F. and a relative humidity of from 85 to 90 per cent are accepted as standard for the storage of apples. The usual humidity of refrigerated storage rooms is about 85 per cent.

Apples in cold storage should be inspected frequently in order that they may be removed and sold while they are still in good condition.

POTATOES.

Potatoes for storage should be "practically free from frost injury and decay and free from serious damage caused by dirt or other foreign matter, sunburn, second-growth, cuts, scab, blight, dry rot and other diseases, insects or mechanical means" as described in Markets Document No. 7: Potato Grades Recommended by the United States Department of Agriculture and the United States Food Administration.

In order to reduce the danger of deterioration from disease and from exposure to atmospheric changes, potatoes should be placed in storage as soon as practicable after being harvested. When stowed in bulk in either common or cold storage, potatoes should be piled not deeper than six feet, and the bins or compartments should be constructed with slat sides and bottoms to provide ample ventilation. They should not be stowed on earth floors. Each bin should contain not to exceed 60,000 pounds of potatoes. When stowed in crates or bags, the containers should be so piled as to permit unobstructed circulation of air on all sides.

The temperature of storage rooms should not be lower than 35° nor higher than 40°. In cellars or common storage houses the ventilators should be of ample size to permit of quick cooling in the autumn to a temperature of 40° or lower. The relative humidity of the storage rooms should be from 80 to 90 per cent to prevent shriveling or softening of the potatoes, but it should not be high enough to cause a deposit of moisture on the potatoes. Daylight should be entirely excluded from the storage room unless the potatoes are to be used for seed.

In properly constructed and well managed common storages, potatoes which are sound and mature when stored in the autumn should keep in a good merchantable condition from four to six months. Under less favorable conditions earlier deterioration may be expected which may require the removal and marketing of the product within three or four months. In sections where a sufficiently low temperature cannot be maintained, potatoes can be held in common storages for only short periods without danger of serious deterioration. When common storage is used, frequent inspection is necessary to avoid holding them beyond their prime market condition.¹ In cold storage, potatoes may be held

¹Stuart, William. Potato storage and storage houses. U. S. Department of Agriculture, Farmers' Bulletin 847. 1917.

in prime condition for six months or longer. However, it is important to avoid temperatures below 35° because of the pronounced sweetening effect of such low temperatures upon the flavor of the potatoes.

SWEET POTATOES.

To keep well in storage, sweet potatoes should be free from serious damage caused by frost, heat, bruises, cuts, scars, cracks, decay, dry rot, or other disease, insects, or mechanical means. They should be dug during periods of dry weather and left exposed to the air a sufficient length of time to remove the surface moisture. Then they should be quickly placed in storage and subjected to the curing process. Sweet potatoes may be stored in bins, crates or hampers. When stowed in crates or hampers they should be so stacked as to allow ample ventilation. When bins are used they should be so constructed as to provide adequate ventilation on all sides and under the floor.

The temperature of the house at the time of filling and during the curing period should be maintained at about 85° with ventilation so managed as to drive off the moisture-laden air. The curing process will require from seven to twenty-one days, depending upon weather conditions. When thoroughly cured the sweet potato will present a bright, clear, dry surface, smooth and velvety to the touch.¹

After the curing period, the ventilation should be so handled that the temperature is gradually lowered to 50° to 55° F. The temperature should be maintained uniformly at this point throughout the storage season by ventilation and occasional heating if necessary. A dry condition of the air in the storage house is absolutely essential to the successful storage of sweet potatoes. If properly cured and of sound stock, carefully-handled sweet potatoes can be kept in good marketable condition for three to six months.

ONIONS.

Onions should be well ripened and thoroughly cured in the field, in drying sheds or on slat trays before they are placed in storage. Decay and deterioration result from the storage of immature, soft, or "thick-necked" onions and from imperfect curing, bruising or other injuries caused by improper methods of handling in harvesting or drying.

When in good condition for storage, onions are well cured, hard, free from loose skins or mechanical injuries caused by rough or careless handling. They should be stored in slatted onion crates or in shallow slatted bins and should be cooled to a temperature of 32° to 36° as

¹Thompson, H. C. Storing and marketing sweet potatoes. U. S. Department of Agriculture, Farmers' Bulletin 970. 1918.

quickly as possible after they are placed in storage. They should be stored in frost-proof ventilated cellars, in well-insulated, above-ground storage houses, or in cold storage houses. In common storage adequate means of ventilation should be provided for the quick cooling of the product and for maintaining a uniform temperature during the storing season.

CABBAGE.

Cabbage should be stored at a temperature of 32° to 35° in a well-ventilated, frost-proof cellar, a common storage house, or in cold storage. The heads should be solid, practically free from injuries caused by insects and diseases and the loose leaves should be removed from them.

Cabbage should be handled carefully in harvesting, sorting and storing in order to avoid early deterioration and decay of the product in storage. The heads should be placed one layer deep on slatted shelves, so arranged as to provide ample ventilation at the sides, floor and ceiling of the storage room. To prevent excessive wilting and consequent shrinkage, a relative humidity of 80 to 90 per cent should be maintained, but moisture should not be deposited on the leaves. The storage cellar or house should be provided with ventilators of ample size for the quick cooling of the product after it is placed in storage.

EGGS IN THE SHELL.

Only large eggs that are fresh and have clean, whole shells should be used for long holding in cold storage. The net weight of a case (30 dozens) of "storage-packed" eggs should be at least 42 pounds. The quantity of eggs on the market in March, April and May is greater and the quality better than those for sale in the summer months. The former are preferable for storage purposes. Commercially they constitute the majority of eggs stored.

The eggs should be packed in new, odorless cases with medium or heavier fillers (3 pounds, 3 ounces to the case). In making the cases 3-penny cement-coated nails should be used. The package should have odorless cushions at both the top and bottom and the lid should be securely fastened with six nails at each end to protect the eggs from damage.

The egg storage rooms should be dry, scrupulously clean and free from all odors. They should be maintained at temperatures of 29° to 32° F. The lowest limit of safety at which eggs may be held for short periods is 28° F. and the highest 33° F. To facilitate the circulation of air about the eggs, it is advisable to place strips of wood about two inches thick under the cases on the floor and half-inch or thicker strips between the cases in the stacks.

If eggs are fresh and have clean, whole shells they may be successfully preserved in cold storage for nine or ten months. In trade practice the deliveries of eggs out of cold storage begin in the late summer and continue through the winter. In only exceptional seasons are eggs left in storage after the first of March.

In commercial stocks withdrawn from storage between November and March those prepared from spring eggs lose by candling an average of 12 to 18 bad eggs per case, and those put up from summer eggs 18 to 42 bad eggs per case. The presence of cracked and leaking eggs in the package because of oversight or carelessness in the original grading or because of breakage before delivery to cold storage rooms, furnishes a considerable number of the bad eggs. In the summer stocks, heated eggs are an additional cause of bad eggs.

The net shrinkage in weight of eggs in case lots varies from approximately 3 to 4 ounces per month or about 30 to 40 ounces after a storage period of ten months. The shrinkage is due to the evaporation of moisture from the eggs.

FROZEN EGGS.

Frozen eggs are used in large quantities by bakers, noodle manufacturers and manufacturers of salad dressing and ice cream. This product is prepared from small, dirty, cracked, shrunk and heated eggs and also from current receipts. These eggs are not suited for storage in the shell, except for short periods. If removed properly from the shell and frozen promptly, they will retain their initial condition for a year or longer. No attempt should be made to use eggs of questionable quality, for a low grade product is bound to result and shipment into interstate commerce would be in violation of the Food and Drugs Act.

The preparation of frozen eggs is an economic industry. It withdraws from the market surplus quantities of edible eggs of a grade below firsts and makes them available the year around. The firms which use them can obtain eggs at a lower price than if they depended upon those in storage in the shell, and as frozen eggs are ready for use as soon as thawed, they are more convenient to use in large quantities than are shell eggs. Frozen eggs are put on the market in the form of whites, yolks, whole eggs or a mixture of white and yolks. A thirty-pound tin can is the ordinary package.

Plants preparing frozen eggs should have facilities on the premises for prompt freezing at a temperature of 10° F. or lower. When shipments are made over long distances to warehouses for long storage, good refrigerator cars properly iced and salted must be used. The packages should be so stowed in the car that they arrive at their desti-

nation in a frozen condition. They should be unloaded promptly and delivered to the cold storage holding rooms hard frozen. When withdrawn from storage they should be received by the baker or other customer still in a hard frozen state.

The standardized rooms, equipment and methods of operation, essential for the preparation of a product of uniform, good quality have been fully described in publications of the Bureau of Chemistry.¹

DRESSED POULTRY.

Poultry going into cold storage must be fresh. It must be absolutely free from any visible or olfactory evidences of decomposition. Poultry for storage should be good for its grade. Well-fleshed birds keep better than thin birds.

The poultry should be "dry picked" and "dry packed." While "ice packed" poultry is sometimes held in cold storage and "scalded" poultry is frequently so handled, the type of dressing in each case is conducive to more rapid aging. Poultry which has been in contact with ice should never be cold stored.

Poultry should be packed in clean, well-made wooden boxes, usually 12 birds to the box, in either a single or a double layer. The box should be lined with a parchment or other suitable paper or each bird should be wrapped in paper. The box should be tight, not slatted, and not stripped. The habit of freezing barrel-packed chickens and fowls should be discouraged.

Dressed poultry is held in cold storage in a hard frozen condition. If poultry is accepted by the warehouse to be frozen as well as held, it should be placed in a "sharp" freezer, that is a freezer carrying a temperature below 5° F. for at least 48 hours. The boxes must be staggered or slatted and the stacks must be low and small enough to permit air circulation. If shelves constructed from brine-filling piping, such as used for fish, are available, the boxes of poultry should be placed on them. Through this method the period required for freezing is cut about one-half.

¹ Pennington, M. E. Practical suggestions for the preparation of frozen and dried eggs. U. S. Department of Agriculture, Bureau of Chemistry, Circular 98. 1912.

Pennington, M. E. A bacteriological and chemical study of commercial eggs in the producing districts of the Central West. U. S. Department of Agriculture, Bureau of Chemistry, Bulletin 51. 1914.

Pennington, M. E. A study of the preparation of frozen and dried eggs in the producing section. U. S. Department of Agriculture, Bulletin 224. 1916.

Jenkins, M. K., and Hendrickson, Norman. Accuracy in commercial grading of opened eggs. U. S. Department of Agriculture, Bulletin 391. 1918.

Jenkins, M. K. The installation and equipment of an egg-breaking plant. U. S. Department of Agriculture, Bulletin 663. 1918.

Hard frozen poultry should be held at temperatures below 15° F. in rooms which are clean, dry and fairly constant in temperature.

Dressed poultry, properly prepared for storage, fresh, properly frozen and held, will maintain its quality for twelve months. While longer periods have not shown a loss in "wholesomeness," the loss in palatability is pronounced.

BUTTER.

Butter that is to be held in cold storage for several months should be made from cream of limited acidity. The cream should be pasteurized, cooled at once, and churned without further ripening. The kind of flavor that develops is determined almost entirely before the butter goes in storage. Butter containing a low percentage of salt keeps better than butter containing a higher percentage of salt.

The butter containers should conform to those styles regularly used in commerce. They include the 63 pound tub, the 63 to 78 pound cubes, and standard boxes for one pound prints.

To prevent the development of mold during the period prior to storage when the wooden tubs and cubes are used, the interior of the packages should be properly paraffined. A sprinkling of salt should be placed over the contents before adjusting the cover. When standard boxes for prints are used, the butter should be placed in the storage as quickly as possible. Storage rooms should be clean and free from all odors.

Deterioration and consequent change of flavor takes place much more rapidly when fresh-made butter is exposed to relatively high temperatures. Therefore this product, when intended for a long storage period, should be placed in the regular storage temperatures as quickly as possible, both to assure the keeping quality while in storage, and after it has left storage for the movement to the consumer.

Butter should be stored at 2 degrees Fahrenheit and below, to secure the best results. While butter stored at higher temperatures may not become unwholesome, changes which reduce its commercial value take place more quickly.

Care should be exercised in the stowing of the packages in the storage rooms so that a free circulation of air beneath and through the pile is permitted. This is particularly true of cube and box packages, which should be separated by one inch dunnage. It is also necessary that the stowing be done in such a way that separate lots may be available for easy inspection.

FISH.

Only fish in prime condition should be frozen. As the time between catching and freezing should be reduced to a minimum, it is well to

locate fish freezers at or near the fishing grounds. Fish which have been shipped long distances from the landing point by express or freight packed in ice should not be selected for freezing.

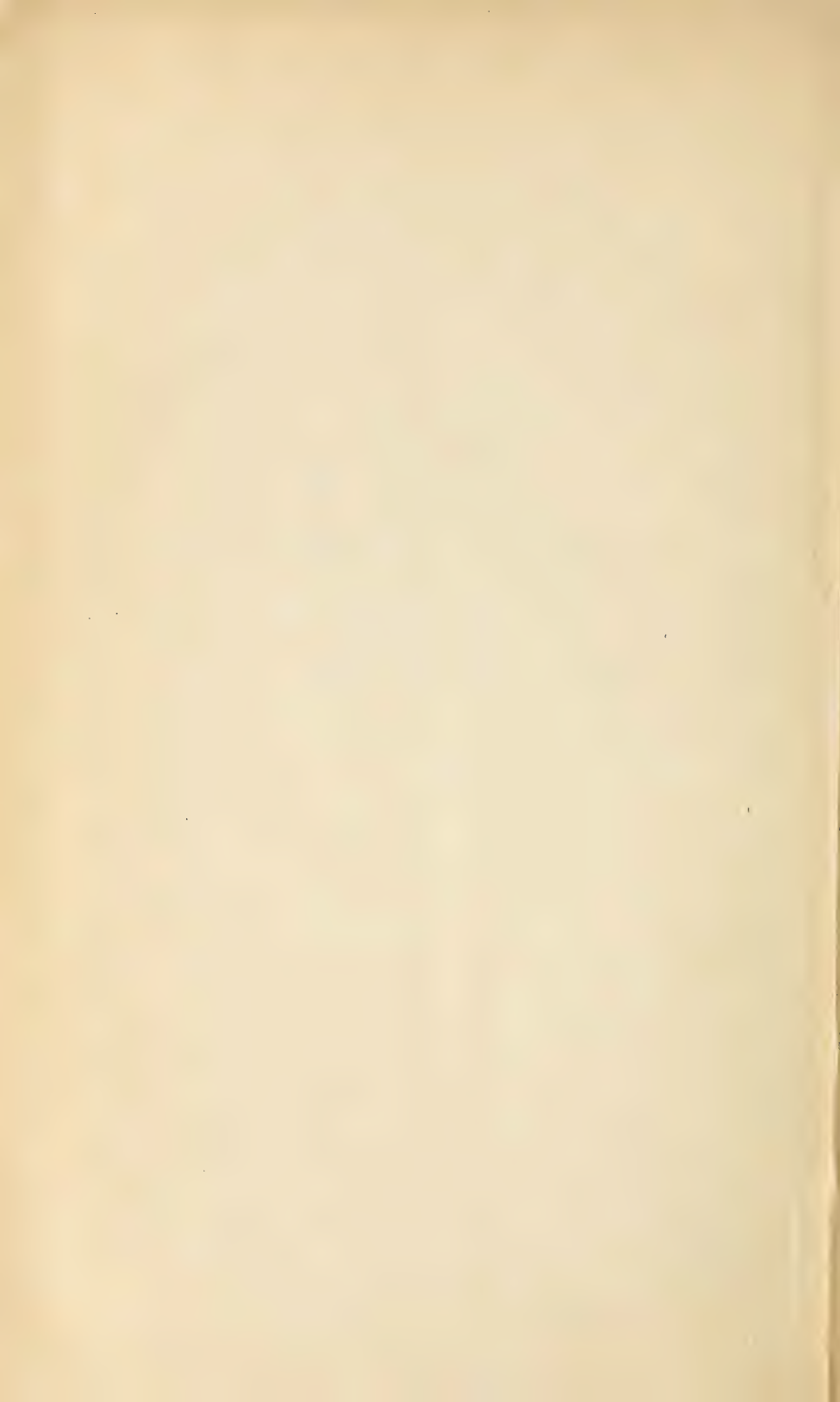
Fish should be washed clean before freezing. Whether they should be frozen "gutted" or "in the round" depends upon the variety of the fish, the size of the fish, and the character of the feed.

Small and medium sized fish are placed in pans to be frozen. Large fish are frozen separately. Very small fish and fish for bait may be "stacked" for the initial freezing.

Freezing should be done at the lowest obtainable temperatures. Generally the temperature of the sharp freezer is between -5° to -15° F. The pans of fish are set on shelves made of refrigerator pipes carrying brine or ammonia. Pan fish should be solidly frozen in 24 hours or less. The holding temperature for fish should be between 0° and 10° F.

Frozen fish should be "glazed," that is, coated with a thin layer of ice formed by passing them a few times through a tank of cold water. Frozen, glazed fish are preferably stored in wooden boxes containing 120 to 160 pounds. When fish are stacked in the holding freezer, or placed in bins and covered, they are glazed by spraying with water. Fish stored more than three months should be reglazed every three or four months during the entire storage period.

Fish can be held without loss of quality for at least twelve months. Some species have been held in good condition for two years.



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UNITED STATES DEPARTMENT OF AGRICULTURE

SUITABLE STORAGE CONDITIONS FOR CERTAIN PERISHABLE FOOD PRODUCTS

(This table should be used in connection with the text of Bulletin No. 729.)

HANDLING FACTORS.			WAREHOUSE REQUIREMENTS.					OTHER CONSIDERATIONS.			
PRODUCT.	PRE-STORAGE HANDLING AND CONDITION WHEN PLACED IN STORAGE.	VARIETIES AND GRADES.	A—CONSTRUCTION.	B—TEMPERATURE.	C—HUMIDITY.	D—STOWING.	E—CONTAINERS.	F—INSPECTION.	STORAGE PERIOD.	SHRINKAGE.	REMARKS.
APPLES.	Apples should be picked when well sustained but not overripe. In all the operations of picking, packing and handling they should be so handled as to avoid bruising, skin punctures and other mechanical injury. In particular, they should be so graded as to be practically free from serious injuries caused by insects, diseases or mechanical means. It is essential that they be handled promptly from the orchard to the storage room and cooled quickly.	Only varieties which have a recognized storage period of three months or more should be considered.	Cold storage houses should be so constructed and equipped as to maintain practically constant temperature throughout the storage season.	Cold storage temperature range should be 31° F. to 33° F. for the storage of apples.	Humidity range, 60 to 80 per cent.	Apples should be stored with ends cut, except in the case of varieties which are to be marketed for inspection and withdrawal.	Containers shall be clean, strong, and free from cracks, and when packed for storage shall be closely stacked with the grain, variety and the grower's or packer's name.	All lots of apples should be inspected when received for storage by a qualified inspector. The inspector should examine the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	The usual cold storage period for water varieties of apples is from three to six months, depending upon the variety and condition of the fruit when stored.	The shrinkage in cold storage is from 25 to 50%.	Attention is directed to the fact that a delay of two or more weeks between the picking and stowing of apples greatly reduces the storage period of the product and results in early deterioration. The successful storage of apples is so much dependent upon the treatment they receive before being placed in cold storage as the conditions under which they are held in storage.
POTATOES.	Potatoes should be well stored, and graded to suit the quality of the product. They should be so handled as to avoid bruising, skin punctures and other mechanical injury. They should be so graded as to be practically free from serious injuries caused by insects, diseases or mechanical means. It is essential that they be handled promptly from the orchard to the storage room and cooled quickly.	All varieties harvested in October will keep in storage.	The building should be so constructed and equipped as to maintain practically constant temperature throughout the storage season.	Temperature range from 30° F. to 40° F.	Humidity range, 80 to 90 per cent.	When stored in bags, bins or barrels, they should be so stacked as to permit free air circulation. Bulk potatoes should be stored in a cooler depth than 8 feet, or more than 60,000 pounds in a single compartment. They should be carefully handled to avoid unnecessary injuries.	Potatoes may be stored in clean, dry, and free from cracks, and when packed for storage shall be closely stacked with the grain, variety and the grower's or packer's name.	Potatoes should be inspected by a qualified inspector when received for storage, and again within 30 days. The frequency of the inspection thereafter will depend upon the condition of the potatoes as determined by previous inspection.	The usual storage period is from three to six months, depending upon the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	When a potato is stored in cold storage, it is subject to a shrinkage of 10 to 15%, although it varies greatly.	Potatoes are usually stored in cullars and cullars are not used in cold storage.
POTATOES (OFFSETS).	Best potatoes should be well developed, carefully handled to avoid bruising, and should be practically free from damage caused by insects, insect or mechanical injury. They should not be allowed to become chaffed or frozen, and when placed in storage the surface should be dry and practically clean.	All varieties grown on a commercial scale.	The building should be so constructed that all light is excluded, and adequate shading in outside structures will not quickly effect its side ventilation. Good construction is preferred, and ample means for ventilation control should be provided.	While the potatoes are being stored, and for a period of two to three weeks thereafter, or until the potatoes are cured, a temperature of from 50° F. to 60° F. should be maintained.	The percentage of humidity should not be so high that mold is developed on the walls of the storage house.	When stored in bins, the potatoes should be carefully packed. They should be so stacked as to permit free air circulation. Bulk potatoes should be stored in a cooler depth than 8 feet, or more than 60,000 pounds in a single compartment. They should be carefully handled to avoid unnecessary injuries.	Best potatoes are usually stored in cullars and cullars are not used in cold storage.	The potatoes should be inspected by a qualified inspector when received for storage, and again within 30 days. The frequency of the inspection thereafter will depend upon the condition of the potatoes as determined by previous inspection.	The usual storage period is from three to six months, depending upon the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	The shrinkage in cold storage is from 10 to 15%, although it varies greatly.	It is recommended that sweet potatoes be not cut, stored, properly stored until they have passed through the curing period.
CORN.	The corn should be well ripened, dry and thoroughly cured when stored. Corn should be practically free from damage caused by insects, insect or mechanical injury, and from other stalk commercially known as chaff.	All varieties of corn, except those of the Bermuda type.	The building should be so constructed and equipped as to maintain practically constant temperature throughout the storage season.	In cold storage the temperature range should be from 12° F. to 35° F.	Low humidity is desirable.	Corn should be stored in suitable receptacles, so indicated under "Containers," and should be stacked in such a way as to permit free air circulation throughout the lot.	The best containers are clean, strong, and free from cracks, and when packed for storage shall be closely stacked with the grain, variety and the grower's or packer's name.	Through inspection the corn should be examined at intervals of 10 to 30 days, depending on the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	The usual storage period of corn is from three to six months, depending upon the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	The shrinkage should not exceed 10% to 15%.	See Bureau Bulletin No. 564.
CABBAGE.	Cabbage must be of solid heads, practically free from injury caused by insects and diseases. Heads should be cut with but few, if any, leaves showing, and carefully inspected from field to storage house. Special care should be used to avoid bruising and other mechanical injury.	Double Head, Red, and other varieties of cabbage.	Well ventilated, frost proof, cool and dry, and equipped with adequate shading in outside structures will not quickly effect its side ventilation. Good construction is preferred, and ample means for ventilation control should be provided.	Temperature range, 32° F. to 36° F.	The humidity should be maintained as high as possible without the development of mold on the product.	Cabbage should be stored in suitable receptacles, so indicated under "Containers," and should be stacked in such a way as to permit free air circulation throughout the lot.	Containers are not generally used.	Cabbage should be inspected at intervals of from 15 to 30 days, depending on the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	The storage period for cabbage is from three to six months.	The shrinkage in cold storage is quite variable.	Proven should be provided in common storage to prevent freezing in cold periods.
EGGS.	Eggs should be moved quickly from the producer to the warehouse. They should be carefully sorted and packed, so that they are practically free from damage caused by insects, insect or mechanical injury, and from other stalk commercially known as chaff.	The grades should conform to those generally adopted by the United States Department of Agriculture.	Cold storage houses should be so constructed and equipped as to maintain practically constant temperature throughout the storage season.	Temperature range, 50° F. to 55° F.	Humidity range, 80 to 90 per cent.	Egg cases should be stored so that separate lots may be easily inspected, and should be so stacked as to permit free air circulation.	Eggs should be packed in clean, strong, and free from cracks, and when packed for storage shall be closely stacked with the grain, variety and the grower's or packer's name.	Inspection of eggs should be made at intervals of 10 to 30 days, depending on the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	The storage period for eggs should not exceed 12 months.	The shrinkage depends upon the humidity, and should be from 10 to 15%.	Boxes must be clean and dry.
FROZEN EGGS.	Eggs should be received from shell in chilled, sealed, and packed in such a way as to avoid bruising and other mechanical injury.	One grade for fresh.	One grade for frozen.	Temperature range, 0° F. or below to 10° F. above.	The humidity should be maintained as high as possible without the development of mold on the product.	Frozen eggs should be stored in suitable receptacles, so indicated under "Containers," and should be stacked in such a way as to permit free air circulation throughout the lot.	Thick round the bodies are not common. The use of smaller containers is advised, to avoid the use of this product.	Inspection of frozen eggs should be made about every 30 days, depending on the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	No change in composition up to 24 months. After 12 months egg shells are subject to a shrinkage of 10 to 15%, and may become puffy, due to air under the egg, and to the use of cold storage.	The shrinkage is not of commercial importance.	See Bureau Bulletin No. 561.
POULTRY.	Poultry should be of good breed, dry, and packed in such a way as to avoid bruising and other mechanical injury.	The grades should conform to those generally adopted by the United States Department of Agriculture.	Cold storage houses should be so constructed and equipped as to maintain practically constant temperature throughout the storage season.	Preferred temperature, 0° F. to 10° F.	Humidity range, 15° F. to 14° F.	Poultry should be stored in suitable receptacles, so indicated under "Containers," and should be stacked in such a way as to permit free air circulation throughout the lot.	All poultry should be packed in clean, strong, and free from cracks, and when packed for storage shall be closely stacked with the grain, variety and the grower's or packer's name.	Inspection of poultry should be made at intervals of 10 to 30 days, depending on the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	The storage period for poultry should not exceed 12 months.	The shrinkage varies from 10 to 15%.	Water-cooled or ice-packed poultry should not be stored for long periods. Reduced birds deteriorate more rapidly than dry-picked. Freeze poultry should be stored in clean and dry.
BUTTER.	Butter should be placed in cold storage within 48 hours after it is manufactured. When storage facilities are not available during this period, the product should be held in a temperature below 60° F.	The grades should conform to those generally adopted by the United States Department of Agriculture.	Cold storage houses should be so constructed and equipped as to maintain practically constant temperature throughout the storage season.	Temperature, 0° F. or below.	Humidity range, 80 to 90 per cent.	Butter should be stored in suitable receptacles, so indicated under "Containers," and should be stacked in such a way as to permit free air circulation throughout the lot.	Butter should be packed in clean, strong, and free from cracks, and when packed for storage shall be closely stacked with the grain, variety and the grower's or packer's name.	All lots of butter should be inspected by a qualified inspector when received for storage, and again within 30 days, depending on the variety and condition of the fruit when stored for a period of 10 to 30 days, depending on the variety and condition of the fruit as indicated by previous inspection.	The storage period for butter should not exceed 12 months.	In general, the shrinkage will run from 15% to 17%.	See Bureau of Animal Industry Bulletin No. 84 and 149.
FISH.	Fish should be placed in storage in a fresh condition, as indicated by their physical appearance.	One grade for fresh.	One grade for frozen.	Temperature range, 0° F. or below to 10° F. above.	Humidity range, 80 to 90 per cent.	Fish should be stored in suitable receptacles, so indicated under "Containers," and should be stacked in such a way as to permit free air circulation throughout the lot.	Fish are stored in boxes and in bulk.	Inspection of fish should be made at intervals of 30 days or more by a qualified inspector.	The storage period for fish should not exceed 12 months.	The shrinkage is not of commercial importance.	Best fish should be kept in three to six months.

DEPARTMENT OF AGRICULTURE ORDERS FOR CERTAIN PERISHABLE FOOD PRODUCTS

As the said department with the view of Public Health No. 1001.

REQUIREMENTS

OTHER CONSIDERATIONS

GENERAL

REMARKS

ADDITIONAL

As the said department with the view of Public Health No. 1001.

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